

The Mining Journal

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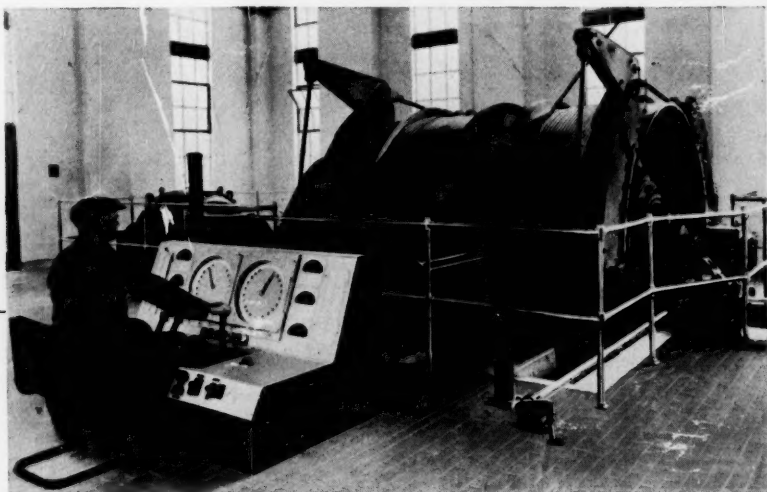
Railway & Commercial Gazette

Vol. CCXXXIX No. 6104

LONDON, AUGUST 15, 1962

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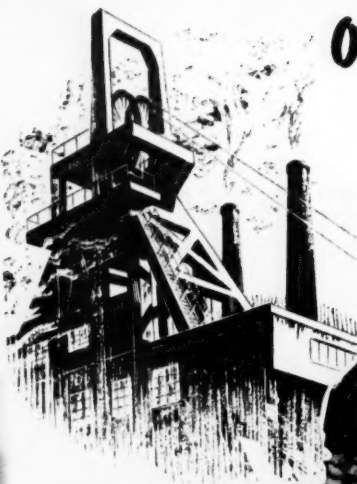
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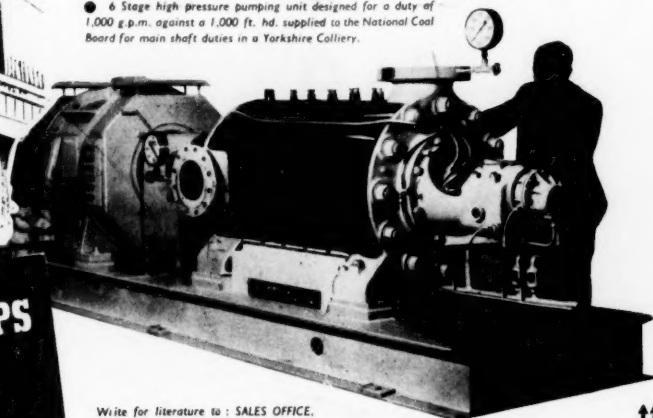
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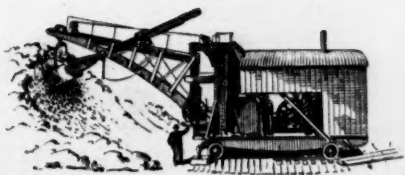
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M.44

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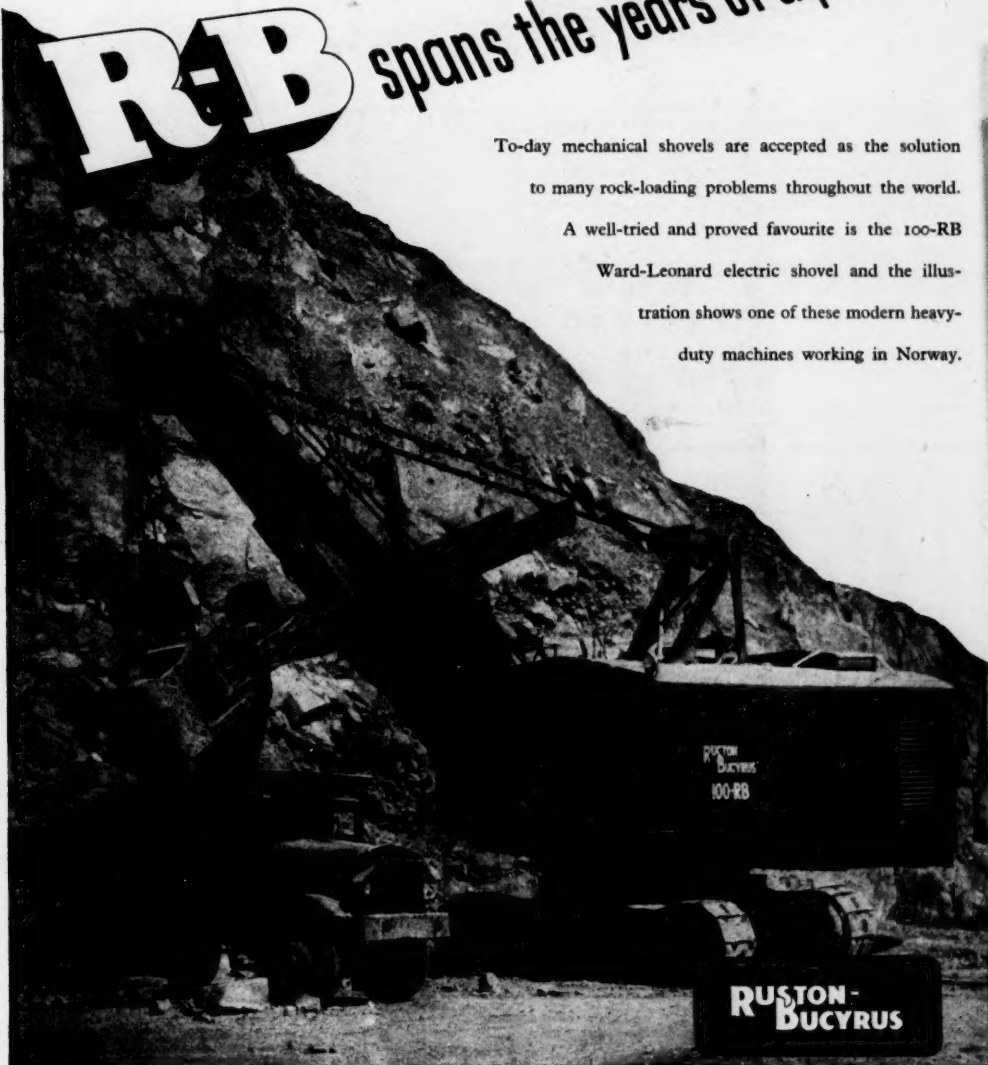
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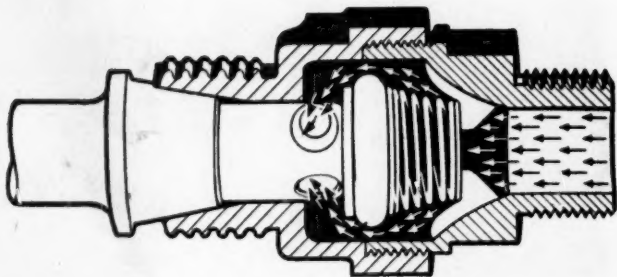
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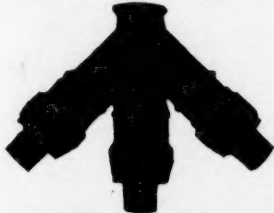
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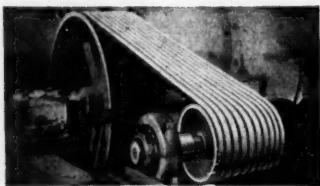
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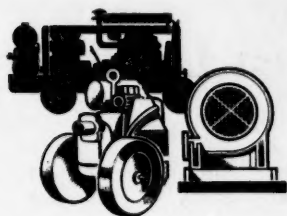
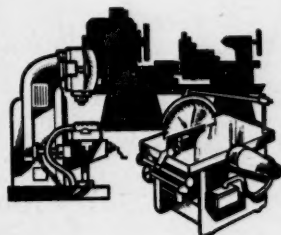
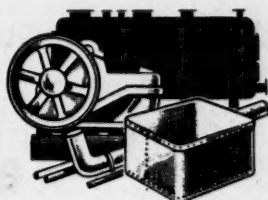
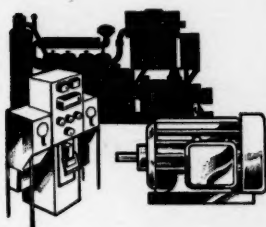
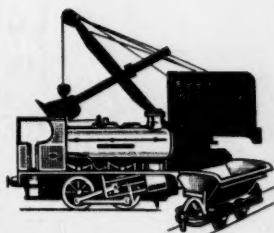
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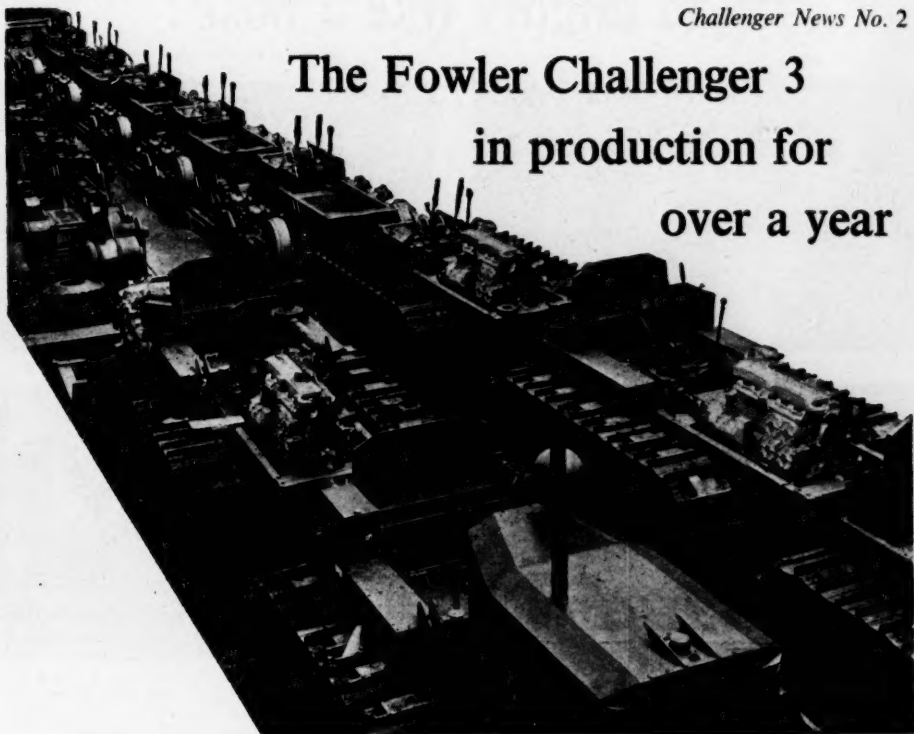
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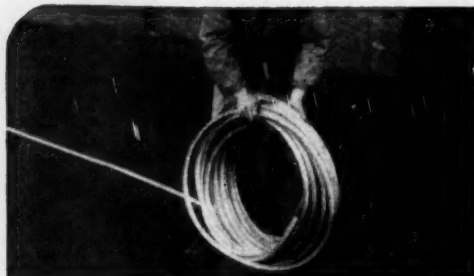
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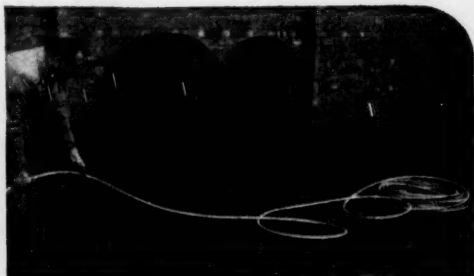
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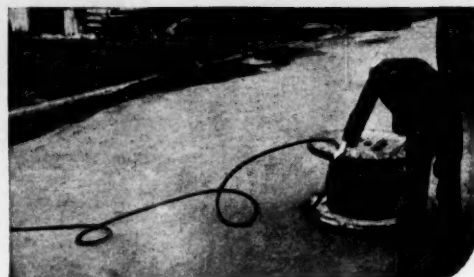
Uncoiling. The right way, treated like a hose



—and the wrong way



Unreeling. The right way, reel rotating freely



—and the wrong way

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The Mining Journal

Established 1855

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LONDON, AUGUST 15, 1952

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NOTES AND COMMENTS

The Paley Report's View of Tin

Following the summary in our issue of June 27 of Volume I of the Paley Report—"Foundations for Growth and Security"—we are commencing with this issue a series of summaries (see page 176) of the Commission's forecast for the supply and demand of the more important metals over the next twenty-five years. It is impossible to do more than highlight what appears to us to be the more important points arising from the immense volume of data contained in the remaining four volumes which comprise not only the work of the U.S. President's Materials Policy Commission, but also of many ancillary panels, especially the Battell Memorial Institute, whose specialists contributed 41 individual reports of which eight are published in Volume IV—"The Promise of Technology"—and supplement the commodity studies contained in Volume II—"The Outlook for Key Commodities."

Inevitably complete conformity of view could hardly be expected as the emphasis on the various problems studied naturally varies, e.g., world mineral resources are in contrast with progress in technological achievements.

The Paley Report is a unique contribution to economic thought, if only that of the United States, and whether it proves historically fulfilled or not must influence economic thought and effort to an extent which its novelty of conception postulates. At the same time it is bound to have some political complexion which is already becoming emphasized in Republican circles in the United States.

In this issue we have elected initially to summarize the Commission's views on Tin not because of its world importance but because of the fundamental impact on the industry of the latest U.S. action and the importance of this in relation to a field in which British interests are so largely concerned.

The report inevitably opens up a wide field for comment and criticism. One of the most important aspects is the estimate given of world tin reserves. There is no indication given of how the estimates are arrived at other than that they have been published, and as the report points out their economic importance is not assessed. Malaya is the only country which we find in any way documented and the figures appear to be those "assumed" by Sir Lewis Fermor in his report on Malaya, based on 1938 data and

from them must be subtracted the tin which has been taken out in the past thirteen or fourteen years which might amount to nearly half the quantity and that presumably of higher than average current grade. Anyway, a further eleven to twelve years life is the best rough estimate which has been put forward in the F.M.S. as compared with the possible life of thirty years allowed by Sir Lewis at the date of his report. In general, the Indonesian reserves used to be assumed to be of higher grade than those existing in Malaya but though the Banka and Billiton Administration doubtless had fairly good estimates of probable life we have never seen them published. So far as we are aware no attempt has been made to reopen the Kappa Kampit lode mine which is the only one worked before the war and the substitution of local labour for the Chinese force previously employed must be reducing the efficiency and competence of the labour force.

Of the basis of the estimate for Thailand of 800,000 tons we have no information but the political future of the country must obviously discount any estimates made before the war.

Of Bolivia we only know that no fresh discoveries have been made for over thirty years, and the social and political outlook is perhaps even more uncertain than that of Thailand. 150,000 tons is estimated to be in tailings, which obviously cannot be treated with the present practice and mechanical installations.

The Congo is the only country where important discoveries have been made of late. (See *M.J.*, March 28, p. 315 and *M.J.A.R.*, p. 121.) The Burma figure seems very problematical and that of Nigeria looks as if it was reached on the assumption of some 10,000 tons output per year for the twenty-five years' period covered by the report.

Perhaps the most astonishing estimate is that for China; which so far as we are aware has never much exceeded 10,000 tons in any one year and has probably been less than half that in recent periods.

No estimate is made for Russia where Soviet sources have claimed important discoveries in recent years: perhaps the figure of 150,000 tons for the rest of the world must be supposed to include these. This residual sweep up estimate does not seem more than an acknowledgment that tin deposits exist elsewhere than in the countries of major production. Incidentally, we do not find any re-

ference to the possibility of recovering tin from stannite of which large tonnages are believed to exist in the world. These cannot be treated economically to-day, but metallurgical advances within the next twenty-five years might alter the outlook if demand intensified research.

However, technological advances we learn make any careful estimate of world reserves of tin ore of comparatively minor importance from a United States' point of view since the general conclusion is that "the trend in the U.S. is to render tin a non-critical metal so we can get along without it where necessary . . . we soon should be in the position where we can take it or leave it according to the economic desirability and available supply."

One of the unconformities referred to earlier may be seen in the projection of U.S. demand over the next twenty-five years by a further 18 per cent of new metal in correspondence with the assumed growth of all United States' industry and needs and irrespective of any diminution in requirement which technical research and economic factors may produce should substitution on increasing scale develop or reserves fail to supply the extra supplies at prices satisfactory to U.S. consumers or more tersely if tin prices itself out of the American market.

The Primary Task of the U.K. Steel Industry

"It is no exaggeration to say that if only adequate steel supplies could be made available to the engineering industry, this industry alone could go a long way towards resolving this country's financial difficulties."

This statement by the chairman of the Ruston & Hornsby group emphasizes anew the crippling effects of the steel shortage, and invests with greater urgency the call for a substantial expansion of production. Apart from the U.S.S.R., this country produces more steel than any other in Europe, yet the most recent statistics show that in regard to the volume of steel exports the U.K. ranks only third behind France and Belgium and is being rapidly overtaken by Western Germany. Moreover, we are importing more iron and steel than we export. To redress this adverse balance is the primary task of the steel industry.

Production can and probably will be substantially increased in the near future. Outputs have been restricted first by the shortage of raw materials and latterly by the observance of the holidays. In varying degrees stocks of fuel, ore and scrap have recently been increased and as soon as the holiday period ends, expansion of production is confidently forecast. At best, however, it will take time to overtake the existing shortage of supplies and the continued import of high cost steel from the U.S. and Western Europe is still an unavoidable necessity.

With several new high capacity blast furnaces in operation, the output of pig iron is rising rapidly and the end of the importation of foreign iron is in sight. Arrivals of pig iron in the first six months of this year exceeded 200,000 tons. Home supplies, however, are now a little more plentiful though haematite, and low and medium phosphorous grades are only obtainable in limited quantities.

Indian Mica Faces Competition

Indian mica, already affected by the entry of Brazil into the market, is likely to face even stiffer competition from manufactured mica in the dollar area in the near future. For a process is reported to have been discovered in the United States, using American mica as the raw material to convert mica particles into sheet mica by a modification of the paper making process. (A note on our "Technical Briefs" page in this issue gives details of the American method.) Essentially the operational process involves prepared mica pulp made on a conventional paper

making machine, which leaves the mechanism with approximately one half of the density of natural mica, and it is reported that mica produced by this method is highly versatile.

In the May 30 issue of *The Mining Journal*, our Indian correspondent writing under date May 8, emphasized the heavy crisis currently facing the mica industry in Rajasthan. According to his report, the Rajasthan Industrial and Mining Association recently submitted a memorandum to the Government of India pointing out that American imports had been considerably reduced and that the most effective solution, according to the Association, would be the discovery of other markets.

Now in a despatch just to hand, our Indian correspondent points out that during 1951-1952 American imports fell to 177,099 cwt. as against 261,427 cwt. in 1950-1951. The mica industry in Bihar is facing a slump, and our correspondent adds that there has been a progressive decline in the demand for mica splittings, which form 70 per cent of the total trade. This has led to the closing down of many of the small employers, and a reduction in working time of some of the big factories.

An important factor in the situation is the exportation of large quantities of low cost mica waste, which has reduced the demand for other types and grades. To counteract this trend, the Central Mica Advisory Committee of India has recommended to the Government that the export of mica scrap be stopped.

Yugoslavia's Aluminium Industry

Yugoslavia plans to be producing 22,500 tons of crude aluminium by 1954, and to further raise output to 37,500 tons by 1956, according to Yugoslav Chamber of Commerce estimates. The estimates state that the production of rolled aluminium products, at present practically nil, will reach the level of approximately 18,000 tons by 1954 and 23,000 tons by 1956. With an anticipated home consumption of rolled products of 10,000 tons per annum, it is hoped that there will be an annual surplus of 13,000 tons of rolled metal and 14,500 tons of aluminium ingots available for export by 1956.

These estimates are based on a Government plan aimed at the completion of a new smelting works at Strisce in Slovenia, an electrolysis plant and rolling mill at Razine, Croatia, and the conversion of an existing rolling mill at Slevenska Bistrica, Slovenia, to the production of aluminium. The present output comes from the smelting works at Lozovac which has a capacity of about 3,000 tons of crude aluminium yearly. If everything goes according to plan, the Strisce works should be working to half capacity by 1954, producing 15,000 tons of crude aluminium annually, and should double that capacity output by 1956. The Razina electrolysis plant should be producing 4,500 tons of aluminium by 1954 and the rolling mill there 15,000 tons of rolled products. All these works are now under construction. The converted rolling mill at Slovenska Bistrica should account for another 3,000 tons of rolled products annually by 1954.

Raw material problems, bauxite and coal, electricity from the Drava hydroelectric station and railway transport, are said to be "practically solved already." It will still be necessary to import a certain amount of cryolite and petroleum coke, however. It is thought that the export of bauxite will not be materially affected by the new aluminium industry, since the Yugoslavs estimate that they could eventually raise production of bauxite by 150,000 to 175,000 tons annually, a figure which would be sufficient to meet the industry's requirements.

Aluminium exports from Yugoslavia in 1951 amounted to no more than 156 tons, mostly scrap, while imports of aluminium products amounted to 608 tons.

South Africa

(From Our Own Correspondent)

Johannesburg, August 4.

With the half-yearly statistical information of the Chamber of Mines to hand, together with the quarterly reports of the various mining companies, it is possible to form a picture of the progress of the mining industry during the first six months of this year and to form some estimate of what may be expected during the remainder of 1952.

Working revenue for the first six months amounted to £69,611,000 against £68,051,000 in the comparable period of 1951. This improvement is largely the result of the contributions made by the new mines coming into production, as the grade of ore milled showed a decline from 3.766 to 3.754 dwt. per ton. The actual tonnage was higher, being 29,710,000 compared with 28,957,000. Here again this came largely from the new producers for the rate of milling in the established mines is still well below its optimum levels as a result of power and labour shortages. This continued milling below capacity, coupled with the continued inflationary trend in prices, exerted a sharp upward pressure on working costs. For the six months they totalled £50,363,000 against £45,283,000 for the first six months of 1951. This is equal to a rise of 2s. 8d. per ton milled and 14s. 6d. per ounce recovered.

The estimated working profit, taking into account the losses incurred by the new Free State mines, but excluding premium gold sales, was £19,248,000 compared with £22,768,000, or 12s. 11d. per ton against 15s. 9d. per ton milled. Premium gold sales brought in £2,221,000 compared with £3,867,000, with this year's figures including a small amount—about 8d. per ounce—received from slightly higher prices from the Reserve Bank as a result of fluctuation in the dollar-sterling rate.

COST TRENDS MAY BE REVERSED

Although the path of the economic prophet is a chancy one, there is growing evidence that the inflationary trend of costs—if not already at its peak—may undergo some reversal during the remainder of the year. This view is held by Dr. de Kock, Governor of the S.A. Reserve Bank. He holds that the world is entering upon a recession of economic activity. For the mining industry this means a drop in prices of imported goods, which must assist working costs, although this may take a little time. More important, however, is that a recession in this country will reduce the demand for labour and power on the part of other forms of industrial activity. The availability of these in greater quantities will in the first place, relieve to some extent the competition in the field of labour which is keeping wages high, and increase the supply of labour, which together with increased power supplies, will increase tonnages milled and reduce working costs. Apart from this possibility—and Dr. de Kock has been remarkably accurate in his assessments of economic trends in his past official declarations as Governor of the Bank—the physical output of gold should rise steadily during the remainder of the year.

NEW PRODUCERS—ACTUAL AND POTENTIAL

Stilfontein has now entered the ranks of the producers and it should not be long before Western Holdings also does so, as trial runs are underway at the present time. Both Freddie's North and South reduction plants should be ready to start up before the end of the year, and Virginia should not be long after this.

All the other three new producers—West Driefontein, St. Helena and Welkom—are getting into their stride, and increasing outputs should become increasingly apparent.

This second half of the year will also see the starting up of uranium production. West Rand Consolidated is the first mine scheduled to undertake this and the others should not be far behind. This, coupled with the revenue accruing to those mines which are to produce sulphuric acid, should keep revenue moving upwards.

A clearer picture of reef values is emerging in the Orange Free State, as increasing amounts of development take place. Work on reef so far is not as great as has been the case in mines on the Rand itself and the Far West Rand at a similar stage of opening up. This is due to the new technique adopted on the mines which started up during the past six months. It has been found that there is less water in the footwall of the reef horizon, and in consequence the bulk of lateral development is being driven in it. So that at present reef exposures are limited. During the rest of the year, however, steadily increasing amounts of work on reef can be expected.

DEVELOPMENT RESULTS INDICATE O.F.S. FIELD TO BE HIGH-GRADE

Taking all the work done so far, the fact is emerging that reef values are reflecting a high degree of correlation with the original borehole intersections, so that taken as a whole the Free State can be accepted as being a high-grade field.

At Western Holdings, the total footage developed during the second quarter of the year was 3,776 ft., of which 270 ft. on reef were sampled, yielding 92.59 per cent payable averaging 72.69 dwt. over 10.78 in., equal to 859 in.-dwt. A start has been made with the drive through to F.S. Geduld. This will pass through the famous Geduld borehole areas, the one which returned the figure of 23,000 in.-dwt. Actual development from this drive in the Geduld area cannot be expected for approximately 12 months, but interesting results are expected meanwhile.

At Freddie's North and South a small amount of development has been done in the areas immediate adjacent to the shafts. At Freddie's North, values obtained were 397 and 416 in.-dwt., and at Freddie's South 234 in.-dwt. Good progress is being made with both the reduction plants, which should be ready in the third quarter of the year. The initial capacities in both cases will be 27,500 tons a month.

At Welkom, payability has increased from 55.92 to 63.92 per cent, but average values were slightly lower at 339 in.-dwt. Good progress is being made with the extensions to the reduction plant.

St. Helena milled 142,000 tons during the last quarter, and costs dropped from 47s. 9d. to 47s. per ton milled. Percentage payability here is still running below expectations, and values encountered remain rather low.

In the southern section of the field, the Harmony Ventilation shaft intersected the Basal reef horizon at 4,364 ft. The original values of sampling around the perimeter averaged 10.08 dwt. over 47.4 in., equal to 478 in.-dwt. In subsequent sampling of the area, exposed on stoping it out for 15 ft. all round to facilitate the eventual removal of the shaft pillar, gave 15.4 dwt. over 45.6 in., equal to 702 in.-dwt.

Interesting figures have also been returned by Virginia Gold Mining. Percentage payability increased from 28.4 to 47.1 per cent and the average value from 243 to 284 in.-dwt. Development has started in the No. 1 shaft area, where the best borehole figures were obtained. On a limited reef exposure, 100 per cent payability was found with values running at 456 in.-dwt. Good progress is being made with the reduction plant, and it may well come into operation later this year, or early in 1953.

THE PALEY REPORT—I

Tin—Substitution vs. Increasing Demand

In our issue of June 27 we published a summary of the first volume of the report recently issued by the U.S. President's Materials Policy Commission and more generally known as the Paley Report. This first volume—"Foundations for Growth and Security"—dealt with the broad economic considerations on which the report was based, and formulated certain general conclusions which to a considerable extent were dependent on the evidence produced in the ensuing four volumes. We shall endeavour in the next few weeks to present summaries of the Commission's forecasts for the supply and demand over the next twenty-five years for the more important metals. These summaries will be based mainly on evidence in Volume II—"The Outlook for Key Commodities" and in Volume IV—"The Promise of Technology." As these reports are extremely voluminous it must be emphasized that the summaries are in no sense comprehensive but seek only to highlight those conclusions most likely to be of interest to our readers. Our own comment on these summaries will appear under "Notes and Comments." The full report of five volumes can be obtained from: The Superintendent of Documents, U.S. Government Printing Office, Washington, D.C.

The Paley Report gives the free world consumption of tin in 1950 inclusive of secondary metal as 167,600 l.tons. Of this amount the United States consumption amounted to approximately 93,000 l.tons, 71,000 l.tons of which represented consumption of new metal.

The projected consumption by 1975 is computed at 226,000 l.tons. Of this amount the United States is expected to require 118,000 l.tons, 84,000 of which will be new metal.

Details of these figures are set out in the table on this page, which should be read in conjunction with the chart showing increased production requirements of new metal. This latter indicates that by 1975 the requirements of new metal will be of the order of 180,000 l.tons or approximately 17 per cent in excess of present consumption.

WORLD'S ORE RESERVES

The report gives the following estimate of the tin ore reserves of the world, in terms of contained tin:

(Long tons contained Sn)	
Malaya	1,500,000
China	1,500,000
Indonesia	1,000,000
Thailand	800,000
Bolivia	500,000
Belgian Congo	500,000
Burma	300,000
Nigeria	250,000
All others	150,000
Total	6,500,000

Of the total reserves about 65 per cent are alluvial deposits, and 35 per cent lode, with an average grade for alluvial of about 0.5 of a lb. of metallic tin per cu. yd. of wash, with lode deposits averaging 1 to 2 per cent Sn.

The report points out that easily discovered high grade ores of tin have long been worked out and the present tendency is strongly towards working alluvial and lode deposits of lower and lower quality and in more inaccessible localities but it concludes that the total world resources on the basis of years of supply, are still impressive, certainly as compared with those of lead and zinc.

The above estimate of reserves is said to be obtained from published documents but not subject to direct determination, and in general it is not possible to give data as to grade, price, recovery factors or economic cut-off points. Thus there exists a relative abundance of low-grade tin ore that cannot be economically mined at prices prevalent over the last decade. A higher price for tin would make such marginal ores utilizable.

The world's tin ore reserves are judged adequate for at least twenty-five years (the term covered by these reports) production at current or moderately enhanced rates (18 per cent is assumed). The chances for increasing these reserves

through continued exploration and improved technology of mining and concentration are considered fair. Tin has not the bright future ahead which may be predicated of aluminium, magnesium, titanium or molybdenum neither has it a dark outlook. It should not be assumed to be a "dying metal."

The position is simplified for the U.S. through the growing influence of substitution; Germany got along with almost no tin during the second world war and the U.S. could do likewise in an emergency, though substitutes would tend to be more costly and less efficient, and broadly speaking the United States will soon be in a position where tin has ceased to become a critical metal and the country can take it or leave it according to the economic desirability and available supply. Even under peace time conditions a plentiful supply of tin at a reasonable price is assured.

PROGRESS IN SUBSTITUTION

Naturally, the Commission's views on the scope for substitution constitutes perhaps the most important section

PROJECTED TIN CONSUMPTION IN THE FREE WORLD
(including secondary metal)

	1950 (000's long tons)	1975	Percentage + or -
United States			
Tinplate	35.7	30	-15
Solder	25.7	39	50
Babbit	5.9	10	66.6
Brass and bronze	14.4	18	25
Tubes and foil	1.6	0	-100
Tinning	2.8	4	40
Other	6.7	17	150
Total *	93	118	27
Canada			
Tinplate	3.4	3.4	0
Other	1.0	1.5	50
United Kingdom			
Tinplate	9.8	9.8	0
Other	13.5	17.6	31
Free Europe			
Tinplate	7.7	7.7	0
Other	18.3	26.5	45
Australia and New Zealand			
Tinplate	2.0	2.0	0
Other	2.4	4.3	79
Japan			
Tinplate	1.1	1.1	0
Other	1.6	3.4	110
Others			
Tinplate	2.0	2.0	0
Other	11.8	31.3	127
Total	74.6	108.6	45
World (all uses)	167.6	226.6	35

* Of which 71,000 l. tons was new metal in 1950, while 84,000 l. tons new metal is estimated for 1975.

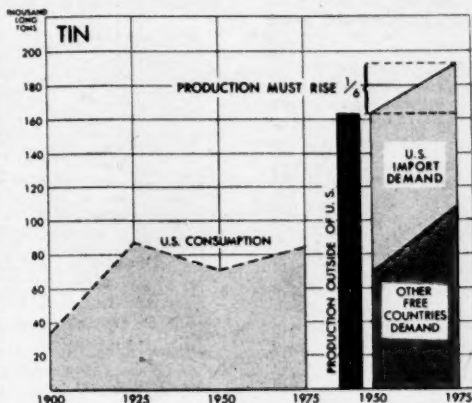
of the report. The most promising metal substitute for tin is aluminium, not so much in solid form as in aluminium plated steel, which may become a strong competitor of tinplate on an economic basis, and in the next twenty-five years aluminium plate may well supersede tinplate for drypacks and possibly some wet food packs, involving the replacement of fully half the present tinplate production without considering other substitutes. Economies in making thinner aluminium plating should drastically diminish the consumption of aluminium at present used for hot-dipped plating.

Nickel, silver, titanium and other metals are for various reasons discounted for plating purposes. Recent work on hot-dip aluminium coating steel products has demonstrated the effects of alloying to reduce drastically the brittle alloy formation and assure excellent adherence and coverage. Hot-dip steel sheet of tin plate grade can be bent

repeatedly until the steel fractures, without flaking of the aluminium coating. Thus, one of the most important factors that have hindered the U.S. coating of aluminium steel has been overcome.

The development of electrolytic tinplate is discussed at length. In 1950, 62.5 per cent of all tinplate was made electrolytically, and within the next twenty-five years it may entirely supplant hot-dipped plate. The average consumption of tin was 19½ lb. per ton of tinplate in 1950 as compared with 35 lb. in 1941. With reduced heaviness of coating on one side consumption of tin could be reduced to 12.6 lb. and with one side coating only to 8.8 lb.

Consumption of tin in the manufacture of hot-dipped terne-plate amounting to about 7 lb. per ston could be avoided by electrolytic coating if the soldering difficulties could be overcome.



This chart, taken from the Paley Report, shows that Free World demand for new tin is expected to increase 18 per cent in the next twenty-five years

lead coating or aluminium

COMPRESSED AIR—II.

Compressed Air in Metal Mining

By J. B. RICHARDSON, A.R.S.M., M.I.M.E., M.A.I.M.E. (Royal School of Mines)

The progress of the pneumatic pusher and the carbide bit have been inter-related, and to-day the use of the pneumatic air leg is fully appreciated, all factors in which compressed air supply plays an integral part. In the following article, which is the concluding instalment to the article in our last week's issue and an extract from that which appeared in *Compressed Air Engineering*, the author notes some of the more marked advances made in underground drill usage and closes his work by a discussion on new uses of air power.

Who would have predicted a dozen years ago that in many mines, and not only British metal mines overseas, the drifter and the stopper would now be on their way out? At that time it was larger and larger jumbos that were envisaged with, for big tunnels, 5, 10 or 15 drifters all mounted on a cumbersome steel structure with large air and water manifolds and headlights. These, however, gave way to the pneumatic pusher with the tungsten carbide bit which has ousted the big machines in mine development and even in large tunnels.

TRENDS IN MACHINE USAGE

The German war-time invention of the tungsten carbide insert bit has spread with great rapidity to most fields because of its obvious advantage of reducing rod changes and because it has made possible the perfectly cylindrical hole, with the resultant increased blasting efficiency, that the explosives engineer had always dreamed of.

Progress of the pneumatic pusher and the carbide bit have been inter-related; it was the combination of the two that made it possible to drill development rounds as efficiently as with the heavier bar- or column-mounted drifter with the now old-fashioned solid steel or even the normal detachable steel bit. This change in British overseas mining practice is largely influenced by the type of labour employed in drilling. It is obviously easier to train a man not used to machinery and with little or no mechanical sense, to use the supported jackhammer than to train

him to use the mounted drifter, with its many pieces to assemble, take down and take care of and with its various bolts to be kept tightened. The former is a much simpler technique and, moreover, with improved manoeuvrability there is a higher percentage of actual drilling time during the drilling shift. Even where skilled white miners are employed this method is favoured even in large tunnels, where a number of such drills are used on a simple platform. In Europe there are a number of operations in which the heavier equipment has been replaced.

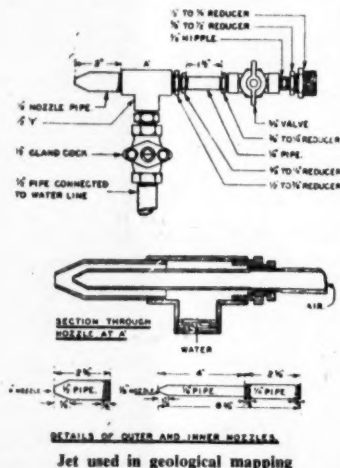
The ubiquity of the pneumatic leg is now fully appreciated. In proving an ore body at the early stages, drifts, crosscuts, vertical rises, winzes and inclines at any angle can be made by the same machine with one operator. The capital saving in such a case is notable; the necessity of buying several drifters, stoppers and jackhammers does not arise, since a smaller number of jackhammers with pneumatic legs will do the same work. The spare parts held in store are much fewer, and there are no heavy columns or bars, no universal joints, no planks, no wedges and fewer hammers, tools and spanners to get lost or damaged—a welcome return to simplicity.

Of course, the popular burn cut has helped, too, to simplify the work of teaching and of getting drillers at work. There is less skill required than in making a good deep pyramid or diamond cut: it needs less careful alignment. Where there is no large distribution problem, the alloy steel shank with carbide insert chisel bit is challeng-

ing the detachable carbide bit, because the foolproof joint between rod and bit has not yet been devised. Many of them, admittedly, are excellent, but they do sometimes snap off at the shoulder, and threads do break and cones split.

The trend in our overseas mines seems to be towards lighter machines with more rapid blows for use by men of lesser physique and stamina and little mechanical aptitude. On the other hand, in North America there is said to be a search for carbide insert bits that will stand up to the punishment of heavier machines and it is claimed that carbide compositions can do the job provided that the support is perfect. There the mounting is no longer the fixed column but the trackless two- or three-machine jumbo.

North America is a region of highly skilled miners with a highly mechanized background both at work and during leisure. How much this trend is due to the large investment in heavier machines with the enormous cost of replacement, and how much to the need for highly paid workers (earning on average well over £1,000 a year) to drill the maximum footage a shift, the author does not know. It will be most interesting to watch the development of these two schools of thought.



Breaking ground in metal mining is largely a problem in logistics—the movement of men and machines over comparatively large areas with the greatest amount of convenience—and cannot be compared with factory conditions in any way.

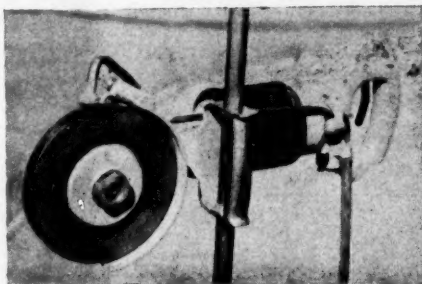
In these days of shortage of trained miners and suitable recruits to the industry in so many different parts of the world the greatest advantage of the return to the lighter, simpler machine is naturally the principle of "one man, one machine."

NEW USES OF AIR POWER

Instead of a decreasing use of such an efficient means of transmitting power as compressed air there is, indeed, proof of its use in several new directions in metal mining. Nothing can be said as yet of the dry driller because it has to be proved in the field; but it is such a necessary tool in deep hot mines, where high humidity means less work done by the miner, that one must wish it every success.

A further interesting development, however, is a mechanical sampler to replace, as well as to improve upon,

the arduous task of cutting channel samples by hammer and moil. This is an adaptation of the diamond-impregnated disc used in cutting rock sections.



The St. Clair air-driven mechanical channel sampler

Another tedious underground task is geological mapping in old mines and abandoned sections of working mines where no clean rock surfaces exist and grime and dust have hardened on the exposed rocks. The geologist must, to do his mapping in his search for possible extensions of ore bodies or the guide to new ones, clean the dirty rock quickly and thoroughly. The expense of doing this by hand is quite impracticable, so he uses a small injector to obtain a powerful jet of wet air to do this work, connecting it by a long light rubber hose to the nearest air and water mains.

Lastly, in completely waterless regions the dressing of minerals has long been an insoluble problem, but the recent development of dry concentration tables operated by compressed air has given great hope that many mineral deposits hitherto incapable of being worked may now be economically exploited.

There has been much discussion on making blast holes with shaped charges (such as were used in the war for piercing the armour of enemy tanks) to pierce the holes, let them cool, and then recharge them with normal explosives to sever the rock and so do away with compressors, pipelines, rock drills and all the other paraphernalia that has to be bought, installed, maintained and operated—but without practical result. At the other extreme, special alloys have been postulated to make cutters, like the rotary shield used in cutting London clay for tunnels of the underground railways, to carve out the hardest rock and do away with explosives as well. But these are only ideas.

We must therefore conclude that this inefficient form of power, used because it is expedient and not because it is cheap, is likely to continue in use for a long time to come in all phases of metal mining activities from prospecting to mineral dressing.



The St. Clair unit cutting a sample

Manufacturers of pneumatic equipment are thus likely to retain the custom of the metal miner who, if he is not in all cases their biggest customer, is at least their most faithful one.

COLONIAL MINERALS DEVELOPMENT—XIV

Aden and Trinidad

By A. G. THOMSON

In the following article, the fourteenth of a series devoted to the mineral wealth of the smaller British territories overseas, the author points out that with the possible exception of Trinidad's oil, the sub-surface wealth of Aden and Trinidad has yet to be largely assessed.

People without first-hand knowledge of Aden are often unaware of the distinction between the Colony and the Protectorate of that name. The Colony is confined to the rock itself and has a total area of 21 sq. miles. The Protectorate, which is divided administratively into Eastern and Western sections, is a very much larger territory with an area of 112,000 sq. miles and a population of 650,000. Originally Aden was administered from India and it was not until 1937 that it became a Colony.

A Geological Survey Department formed in January, 1951, has investigated various mineral occurrences, both in the Colony and in the Western Protectorate, but so far the results have been disappointing. Despite the occurrence of igneous rock no metalliferous deposits of commercial significance have come to light.

Occurrences of mica, galena and iron ore were examined, but in no case was there a sufficient quantity of the mineral for the deposit to be of economic value. It is possible, however, that payable occurrences of mica might subsequently be discovered, since float mica of a size suitable for industrial use has been brought in from several places, though the parent pegmatites have not yet been located. The iron ore occurs in granite gneiss as lenses of magnetite in quantities too small to be of value for export.

Little systematic geological mapping has been carried out because no suitable topographical map is available as a base. In order to establish the general succession of the rocks in the area a rangefinder and plane-table survey has been made of the road from Shuqra, a village on the coast some 66 miles north-east of Aden, to Ladar, some 45 miles to the north. A geological reconnaissance map on the scale of 1:1,000,000, based on the topographical map of Asia on this scale, is being prepared from observations made. It remains to be seen whether the mineral possibilities indicated by preliminary investigations will be regarded as sufficiently promising to justify detailed geological mapping.

NO ECONOMIC ORE DEPOSITS FOUND

No territory in the Commonwealth has been more extensively investigated geologically than Trinidad, but no ore deposits of economic importance have yet been discovered. The first official geological survey of the island was made by P. G. Wall and V. G. Sawkins, who were seconded from the Geological Survey of Great Britain, and whose report was published in 1860. A series of papers by E. H. Cunningham Craig, published by the Government of Trinidad, appeared between 1904 and 1907. With these exceptions most of the geological work on the island has been done by geologists of the oil companies.

The islands of Trinidad and Tobago constitute a single Colony with a population (in 1946) of 557,970, of which Trinidad had 530,809 and Tobago 27,161. Trinidad is situated at the extreme south of the chain of islands known as the West Indies and is 4,005 miles by sea from London and 1,958 miles from New York. With an area of 1,863 sq. miles it is approximately the size of Lancashire. Geologically Trinidad is part of the South American Continent, from which it has been severed in late geological times. It is immediately opposite the delta of the great Orinoco River.

Oil is Trinidad's most important mineral product and its principal source of wealth. There are at present eleven companies engaged in the petroleum industry. Four companies operate shipping terminals and two—Trinidad Leaseholds Ltd. and United British Oilfields Ltd.—maintain refineries and purchase crude oil from other local companies, besides producing it themselves. An increasing amount of foreign crude is being imported each year, the refined products being re-exported. A large part of the refinery output is disposed of to the local bunker trade and in shipments to the United Kingdom. A small amount of crude is exported for refining to Canada. Vigorous drilling programmes are being carried out, but the results of recent exploration have been disappointing. Sufficient drilling has been done to maintain the Colony's crude production in the vicinity of 56,500 bbl. per day. Last year Trinidad's output of crude petroleum amounted to 3,050,000 tonnes.

EXTENSIVE GEOLOGICAL INVESTIGATIONS

There is an annual production of some 120,000 tons of asphalt from the Lake of La Brea, an immense deposit of bitumen in the crater of an old volcano, which more than three centuries ago provided Sir Walter Raleigh with excellent pitch to caulk the seams of his ship. The La Brea Lake is well over a hundred acres in extent and is estimated to contain over 9,000,000 tons of bitumen. Borings have shown the pitch to lie 135 ft. deep, but the supply is believed to be inexhaustible. Some gypsum has been produced in the past, but no large deposits are known. Supplies of building stone and road metal are available on the island. The occurrence of lignite deposits in the Central Range was reported many years ago by Cunningham-Craig. Attempts have been made to work these deposits, but they are poor in quality and do not appear to be very extensive.

Major A. E. G. Sutton was appointed Government Geologist for three years until March, 1952, when he left the island. His task was to complete a geological map and prepare a geological report from all the work which had been done by the various oil companies. The collecting of geological maps of various Crown Lands held under licence by the oil companies has been carried out and the geological map is in preparation. Its final completion awaits a closer measure of agreement on the correlation of structures and formations of adjacent areas. The oil companies have undertaken that during the next few years Dr. Kugler shall prepare a further and still more complete compilation of maps and reports than yet made.

A survey of all the quarries, past and present, has also been undertaken. The quarried rocks include limestones, calcareous sandstones, porcellanite, clays, gravels, sands and asphaltic oil sands. A Geiger-counter was used on surveys of the Northern Range but no radio-active rocks were discovered.

Tobago was visited in 1950 in connection with a road metal survey and a number of rock specimens were collected. Valuable advice has been given on problems of water supply, bridge and road foundations, and marine erosion.

Reports have been submitted to the Governor of the Windward Islands on uranium surveys in St. Vincent and Grenada, as well as on glass sands and road metal.

TECHNICAL BRIEFS

Sheet Mica Produced by Paper-making Process

Development work in the processing of mica into continuous sheets for electrical insulation, which started in France during the German occupation, has culminated in America in improved economical methods for forming sheets of mica, using conventional paper-making equipment. (The establishment of this process in America is mentioned in "Notes and Comments" in this issue.) The raw material consists of muscovite mica in the form of domestic and mine waste, scrap or recovered mica. The manufacture of the sheets is similar to the manufacture of paper from wood pulp, according to a notice in *Electrical Engineering*.

In preparation, the mica is partially dehydrated by heating. Immediately after leaving the furnace, the hot mica is placed in a saturated solution of sodium carbonate or bicarbonate. This removes the swelling between the layers of the mica and the mass is then allowed to cool. At this stage the thin layers scarcely adhere to each other. Still containing a large amount of the alkaline solution, it has to be drained, and is then immersed in a strong solution of hydrochloric acid or sulphuric acid, which causes it to puff to as much as a hundred times its original thickness. At this point, the layers of mica are so loose that only washing and agitation are required to reduce the mica to a pulp.

The pulp is now ready to be made into a continuous sheet. It can be made on a Fourdrinier machine, the conventional mechanism used in paper-making. As the sheet comes from the machine it has about one-half the density of natural mica because of the air between the layers. The tensile strength depends on the source of the mica and the type of treatment it has received, and before it can be used, a binding agent must be applied. This is achieved either by spraying or dip-coating.

As an example of the versatility of mica made by this method, it is of interest to note that it has been used as a component in silicone-moulding plates, while its homogeneity and uniformity make it suitable for such purposes as the manufacture of commutator segment plates, and for various types.

Geological Survey Equipment

A partial list of more than a \$1,000,000 worth of new scientific equipment supplied recently by the American Government to British research laboratories working to develop better and cheaper industrial and consumer goods, has been released by the M.S.A. mission. Among these units, two pieces of equipment which will be of assistance in the completion of geological surveys have been announced by the Fuel Research Station of the U.S. Department of Scientific and Industrial Research.

The first, a temperature-compensated Worden Gravity Meter from the Houston Technical Laboratory, will be of particular value owing to its portability which will make possible detailed gravity surveys in country at present inaccessible for this purpose. The aim of this survey is to enable the coal industry to plan the development of existing coalfields and the prospection of new ones, and the main areas to be surveyed will be those where the structure of coal-bearing strata is concealed beneath an uncomfortable cover of younger rock.

The second equipment piece is a deep sounding gear from Haliburton Oil Well Cementing Co., for the exploration of water levels and for the geophysical investigation of strata at depths to 5,000 ft. Use of this unit offers many obvious advantages, amongst which is the realization that a knowledge of underground water supplies is important for the location of industrial units requiring large supplies of water.

The Action of Oxygen in Flotation

Flotation experiments to determine the effect of oxygen on the flotation of metals and sulphides have been carried out by N. Plaksin (*Izv. Akad. Nauk. S.S.S.R., Otdel. Tekh. Nauk.* 1950, 1827 and 1189). The author believes that the natural hydrophobicity of minerals may be explained by the sorption of oxygen after which hydrophobicity decreases. This hydrophobicity reaches a maximum during collector action depending upon the nature of the metal. The best collector action occurs after there has been a brief preliminary action with oxygen.

A method combining gravitational and flotation principles has

been suggested by the author in conjunction with I. I. Kurenkov, in which the basic apparatus consists of a concentrating table equipped with jets of water and a gas feed from the sides of the working surface. Preliminary treatment of the ore pulp with air or oxygen considerably improved both recovery and the grade of concentrate.

New U.S. Ceramic Fibre—"Fiberfrax"

A new synthetic ceramic fibre called Fiberfrax, claimed to have a wide range of potential uses where asbestos and glass fibre properties are required, has recently been introduced by the Carborundum Co., America.

The new product is made by melting aluminium oxide and sand in an electric furnace and then subjecting the molten mass to an air blast. The material is blown into a fluffy mass made of random arrangements of extremely fine fibres. Fiberfrax is resistant to temperatures that melt cast iron and is being used as a high-temperature insulation for combustion and exhausting systems of jet engines. It is being studied for use in insulating panels to deaden sound, resist fire and prevent heat losses, for gas and fume filtration, as well as for use instead of, or in combination with, asbestos in many electrical and thermal applications.

At present, Fiberfrax is not available in spun, woven or continuous filament forms, although mixtures with other fibres permit carding and spinning. The fibres range up to 3 in. in length and are adaptable to refractory markets served by carborundum because of their high heat resistance, light weight and low heat transmitting properties. The present pilot plant output is approximately 30 tons per month.

Tin Metallurgy in Japan

The treatment of tin ore at the Akenobe mine of the Mitsubishi Mining Co. has been described by Motoo Watanabe (*Japan Sci. Rev. Ser. 1.; Eng. Sci. 1, No. 4, 67, 1950*). The ore is first roasted with soda ash to remove insoluble tungsten compounds in the form of sodium tungstate. The amount of soda ash used is critical, since if it is too small all of the tungsten is not removed and if it is too large there is a loss of tin. The tungsten is precipitated out as calcium tungstate and the concentrated tin ore is then smelted in a reverberatory furnace.

In order to obtain minimum loss of tin in the slag, the iron concentration in the ore must be low. Tin recovery from the slag is achieved by vaporization in a rotary kiln, and for maximum recovery the furnace atmosphere must be carefully controlled and a suitable sulphurizing agent used; the best for this purpose being gypsum.

Improved Dry Magnetic Separation

The separation of mixed sizes of ore by magnetic methods is rendered difficult by the attenuation of the magnetic field; size classification of the ore being treated produces a cleaner separation but is not always practicable. According to Sysolyatin (*Gornyi Zhur.* 125, No. 11, 37, 1951), the advantages of sizing can be obtained in two ways. Firstly, a breaker plate may be provided at the point of discharge of the ore from the feeder or, secondly, the discharge end of the feeder may be directed in opposition to the direction of rotation of the separator. Either of these methods will arrange the particles so that the largest are nearest the separator whilst the smallest ones will lie on top. By these means, therefore, the cleanness of the separation is greatly enhanced.

Extraction of Gold and Silver

The use of activated charcoal in the extraction of silver and gold has led to the introduction of numerous methods of treatment of the loaded charcoal. In a method recently claimed by J. B. Zadra (*U.S.P. 2,579,531*), the charcoal is treated with a caustic solution of sodium sulphide in order to extract the gold. If silver is also present a second treatment with sodium cyanide is necessary to extract the silver. The gold is removed from solution by electrolysis using an insoluble anode and a pre-coated, charred excelsior cathode. The caustic sodium sulphide is re-formed for use by the addition of sodium sulphite and the cycle is repeated.

METALS, MINERALS AND ALLOYS

In its current issue, the Treasury's *Bulletin for Industry* makes the not very startling statement that "supplies of non-ferrous metals (with the possible exception of copper) should be sufficient to meet the expected increase in demand arising from the probable increase in engineering output made possible by improved steel supplies." If further support were needed for this view it is to be found in the June returns of the Bureau of Non-Ferrous Metals Statistics which again indicate further increases in stocks of lead and zinc in this country. The figures appear in our usual table on the next page.

COPPER.—Although since the introduction of the 40 per cent foreign—60 per cent domestic ratio for U.S. consumers the full foreign quota has been taken up for July and August, some doubts are being expressed as to whether American buying will continue to exercise this same pressure on the market through the autumn. American copper users have probably been inclined to buttress their stocks while the possibility of a copper strike has been in the air, and in another direction it may be significant that the U.S. Office of International Trade has announced a fourth quarter export quota of 45,000 s.tons of copper refined from foreign ores, compared with a third quarter quota of 12,000 tons refined from both foreign and domestic ores.

On the basis of last year's mine output, Chile should be producing some 35,000 s.tons per month, equivalent to about 120,000 s.tons since the beginning of May when the U.S. contract was abrogated. As reported here two weeks ago the Central Bank of Chile claims only to have sold 70,000 tons from then to the end of July, and it remains to be seen how long this seller can afford to carry rapidly mounting unsold stocks at the price which Chile has elected to set for her copper.

Meanwhile, Japanese smelters are reported to be increasing their purchases of Chilean ore, and it is believed that they have between 12,000 and 16,000 tons contracted for shipment over the next three or four months.

LEAD.—U.S. mine output during the first six months of this year totalled 202,482 s.tons, a slight decline from the figure of 203,993 s.tons in the corresponding period in 1951. Although the New York lead price remains steady at 16c., this has not been due to any strong buying support. U.S. battery manufacturers in particular are reported to be hanging back, despite the fact that shipments of replacement batteries for the first half of this year were running at about 2,300,000 below last year's half year total of a little over 9,000,000. The replacement battery market can scarcely have been affected by the recent automobile plant stoppages, and increased shipments for the remainder of this year seem probable.

The Ministry of Materials price remains unchanged at £131 which, in spite of some hardening in Continental quotations, is still about £15 above the free market price across the Channel. With the prospect of dealings on the London Metal Exchange being resumed in the autumn at prices substantially below the Ministry's present quotation, U.K. consumers can hardly be in any hurry to buy.

TIN.—Last week negotiations were resumed between the R.F.C. and the Bolivian Government for a long-term tin contract. The Bolivian group is headed by Mr. Victor Andrade, the new Bolivian Ambassador to the U.S.A. There have been no developments to modify the already widely held view that 121½c. is the best price the Bolivians can hope for, and negotiations seem likely to centre mainly on the length of the contract.

Mr. Andrade professes to take the view that despite the de-control of U.S. tin imports, imports of concentrates must remain the province of the R.F.C. because of its ownership of the Texas smelter. Nevertheless, we do not see what is to prevent the Texas smelter buying its concentrates through private traders and, moreover, very possibly doing so at a price below the 121½c. to which the R.F.C. would probably be committed.

Indonesian tin production is showing signs of recovering from the 2,000 ton decline which it manifested last year, the production of 32,102 tons in 1950 having been the highest achieved since the Japanese occupation. Production of concentrates for the first seven months of 1952 are reported to be 19,285 tons compared with 17,592 for the corresponding period a year ago.

ZINC.—After easing to 13½c. last week the spot zinc price, East St. Louis, has now firmed up again to a 14c. level. The Ministry of

Materials' price has closely followed these movements, having been cut £12 last Friday and being subsequently raised again by £4 this week to £122 at which it now stands.

No very clear justification for this resilience is apparent, and certainly the American Zinc Institute's July statistics do nothing to support it. These again show a large increase in stocks of slab zinc which have nearly trebled between June 1 and July 30. On this latter date stocks stood at 96,919 s.tons. U.S. slab zinc production for the first seven months of the year totalled 566,730 s.tons compared with 546,598 s.tons in the corresponding period last year.

The Continental free market remains depressed at little better than £100 per ton f.o.b.

In the U.K., restrictions on the use of zinc are to be removed almost at once, although restrictions in the use of copper in copper-zinc alloys will continue. Although the allocation system will be discontinued, licences will still be required to obtain virgin zinc.

ALUMINIUM.—With a production of 461,536 s.tons the U.S. aluminium industry increased its production by 17 per cent during the first six months of 1952 as against the first six months of 1943 which was the peak year for the war-time production, and by 14½ per cent over the same period a year ago.

Following on the rebuff to the D.P.A.'s domestic expansion programme put forward earlier this year, the Office of Aluminium is now understood to be about to put forward a fresh set of proposals designed to bring new producers into the primary metal field. Whatever scheme may eventually be agreed the feeling in Washington still seems to be that they will not be able to get by without expanding the existing Canadian supply programme.

The D.P.A. is also asking for a greater supply of bauxite. The aim for 1953 being a total U.S. supply of 8,000,000 l.dry tons, an increase of 3,000,000 over the figure for 1951.

The new aluminium smelter at Isle Maligne, Quebec, belonging to Aluminium Ltd. is in production and should soon be operating at the full capacity of 50,000 tons per annum.

Reports from Rio de Janeiro state that Brazil's second aluminium mill, being built near Sao Paulo, will start operations by the end of this year. It has a capacity of 7,000 tons per annum. Brazil expects to satisfy her own demand for aluminium by 1954, and to be in a position to export about 35,000 tons annually by 1962, unless domestic consumption increases. The plant is sufficiently advanced for production to be reckoned to commence in the beginning of next year. The annual rate at the start will be 5,000 tons, but this will be more than doubled by 1954.

The Dabrica bauxite mines, near Stolac in south-eastern Hercegovina have commenced producing at a daily rate of 300 tons. Total bauxite exports from Hercegovina are expected to reach 270,000 tons this year.

COBALT.—The Silver Miller Mines of Canada has announced the signing of a contract with the U.S. Government for the sale of 5,000,000 tons of cobalt. This is stated to be the first contract ever received from Washington by a Canadian cobalt-silver producer and has been made possible by the recent lifting of the ban on export of Canadian cobalt metal. As the ban on export concentrates has not been lifted it is assumed that the smelting will be done for the U.S. by Deloro Smelting and Refining.

COLUMBITES.—The Wah Chang Corporation, New York City, has been named as one of the U.S. Government's three purchasing agents of the urgently required columbium-tantalum ores and concentrates for the national stockpile and other defence purposes. The increase in the number of purchasing agents for these ores and concentrates follows on the recently announced M.S.A. order offering incentive bonus, which will have the effect of about doubling the current market price, for columbium-tantalum ores and concentrates whether they be of domestic or foreign origin. Details of the incentive bonus were given in our issue of July 18 last.

MAGNESIUM.—The Secretary for Overseas Trade, Brigadier Harry Mackeson, disclosed in the House of Commons prior to the summer recess that Alcan is to supply 2,640 tons of magnesium a year to the U.K. for the next 20 years. The price is not to exceed the lowest domestic price in Canada at the time of delivery. The company is to receive a loan of \$2,200,000 to help finance the cost of expanding the plant. Alcan announced in July that

the Arvida plant in Quebec was to be extended, raising production by 1,000 tons per annum to 4,000 tons. Presumably this is the plant for which the present loan is sought and which will supply part of the bigger export. Apparently, the Magnesium Elektron factory near Burnley would cost much more than the Alcan plant.

Replying to the question why the Magnesium Elektron factory, near Burnley, could not be used to meet this demand, Brigadier Mackeson said that this had been given careful consideration before the agreement was made, but the idea was rejected on the grounds that the cost of the magnesium produced would be substantially higher than that of the aluminium imported from Canada.

NICKEL.—The Newmont Mining Corporation and the Nihon Yakin Kogyo KK (Japan Metallurgical Works) are jointly under taking the construction of a pilot plant in Japan which will produce nickel on behalf of the American company. Although Japan has been considered a high cost nickel producer, it is reported that with the aid of a unique technique, the pilot-plant will be able to produce nickel matte very cheaply, at approximately 400,000 yen per ton, c.i.f. Vancouver. This is the price at which the Newmont Mining Corporation is interested. But in order to supply the nickel at this price, c.i.f. Vancouver, nickel imports from Le Nickel would have to be at a lower price than that now prevailing, which is between 8,000 and 9,000 yen per ton, c.i.f. Japan. The Japanese company are also relying on Newmont Mining to persuade Le Nickel to supply more nickel ore than the 150,000 tons which they have contracted for annually.

SULPHUR.—The production of 443,017 tons of native sulphur in the U.S. during June was slightly less than the output in May of 460,058 tons. Nevertheless, producers' stocks rose by 75,000 tons to 2,902,335 tons.

The Gulf Sulphur Company of Delaware has reported the discovery of the world's deepest sulphur mantle near San Cristobal, Vera Cruz, and is planning to drill more wells in the same area.

TITANIUM.—D.M.P.A. has signed an agreement with E. I. du Pont de Nemours for a loan of \$14,700,000 to be used in stepping up production of titanium. The loan is to be repaid in the form of titanium sponge over a five-year period; the production target is 13,500 s.tons. The agreement between D.M.P.A. and Titanium Metals Corporation provided for the production of 18,000 tons of titanium sponge over a period of five years.

URANIUM.—The U.S. is expected to benefit from the projected expansion in the output of uranium in Canada. Reports from Ottawa state that by next April the production of uranium will have doubled, because of the development of the Beaver Lodge property in the far north of Saskatchewan.

The London Metal Market

(From Our Metal Exchange Correspondent)

Following the fall in the tin market last week a moderate recovery has been seen over the week-end. American traders are reported to have bought a little metal but at the moment there is not any large quantity of Straits tin for early delivery available. However, America is not short of tin and they can afford to wait until supplies are more readily available as consumers can cover their immediate needs from the R.F.C. at 121½c. if they wish. The present time of the year is usually a quiet one, but with the steel strike ended consumers may be in the market again possibly for forward purchases, if and when material is available, at a price sufficiently below the R.F.C. figure to make such purchases attractive.

The American zinc price was lowered towards the end of last week, followed by a drop in the Ministry of Materials quotation to £118 per ton on the 8th instant. The former has since recovered ½c. to 14c. and the Ministry's price has accordingly been raised to £122 per ton. Demand has been slow, but it may be that the recent advance will create a little more interest.

The American free price of copper remains about 36c. and the European price of lead is in the region of £120 with business quiet.

On Thursday the official close on the tin market was: Settlement price £944, Cash Buyers £943, Sellers £944; Three months Buyers £937, Sellers £938. In the afternoon the market was barely steady. Turnover for the day was 210 tons. Approximate turnover for the week was 1,090 tons.

The Eastern price on Thursday morning was equivalent to £958 5s. per ton, c.i.f. Europe.

REFINED COPPER PRODUCTION AND STOCKS—JULY

(000 s.tons)

	Production			Stocks		
	July, 1952	Jan.-July, 1952	Jan.-July, 1951	July 31, 1952	June 30, 1952	July 31, 1951
U.S.A.	96	675	739	74	71	68
Other countries	119	742	691	180	193	159
World.....	215	1,417	1,430	254	264	227

Source: American Copper Institute.

U.K. PRIMARY METAL STATISTICS—JUNE

(long tons)

	Refined Copper	Lead*	Slab Zinc	Tin Metal
Stocks in U.K. June 11	86,392	120,261	79,350	5,357½
Imports	17,058	8,639	14,113	61
Production	9,983	6,044	6,222	2,664*
Consumption	30,455	13,345	12,437	1,732
Exports and Re-exports	49	36	1	2,400
Stocks in U.K. June 30; ...	83,503	121,576	87,526	4,171½

(Source: British Bureau of Non-Ferrous Metal Statistics)

(*) Estimated by International Tin Study Group. (†) Includes imported virgin lead and English refined from domestic ore and secondary material. (‡) Including Government stocks other than strategic reserves. (§) In addition U.K. stocks of blister copper at the end of June were 23,306 tons; of zinc concentrates were 36,183 tons; and of tin in the form were 2,932 tons. (||) Including tin in official warehouses and smelter carry-over.

AUGUST 14 PRICES

COPPER

Electrolytic £285 0 0 d/d

TIN

(See our London Metal Exchange report for Thursday's prices)

LEAD

Soft foreign, duty paid £131 0 0 d/d
Soft empire £131 0 0 d/d
English lead £132 10 0 nom.

ZINC

G.O.B. spelter, foreign, duty paid ... £122 0 0 d/d
G.O.B. spelter, domestic £122 0 0 d/d
Electrolytic and refined zinc £126 0 0 d/d
Special high grade £128 0 0 d/d

ANTIMONY

English (99%) delivered,
10 cwt. and over £225 per ton
Crude (70%) £210 per ton
Ore (60% basis) 25s.—27½ nom. per unit, c.i.f.

NICKEL

99.5% (home trade) £454 per ton

OTHER METALS

Aluminium, £157 per ton. Osmium, £70 oz. nom.
Bismuth, 19s. lb. Palladium, £8 10s. oz.
Cadmium, (Empire) 14s. 4d. lb. Platinum, £27/33 5s. nom.
Chromium, 6s. 5d. lb. Rhodium, £45 oz.
Cobalt, 20s. lb. Ruthenium, £30 oz.
Gold, 248s. f.o.z. Quicksilver, £65/£65 10s. ex-warehouse
Iridium, £65 oz. nom. Selenium, 25s. nom. per lb.
Magnesium, 2s. 10½d. lb. Silver 7½d. f.o.z. spot and f'd.
Manganese Metal (96%-98%) Tellurium, 18s./19s. lb.
2s. 2d./2s. 3d. per lb. d/d
Osmiridium, £35 oz. nom.

ORES, ALLOYS, ETC.

Bismuth 40% 8s. lb. c.i.f.
30% 6s. 9d. lb. c.i.f.
Chrome Ore—
Rhodesian Metallurgical (lumpy) £14 2s. per ton c.i.f.
" " (concentrates) £14 2s. per ton c.i.f.
" " Refractory £13 14s. per ton c.i.f.
Baluchistan Metallurgical ... £15 8s. per ton c.i.f.
Magnesite, ground calcined ... £26 - £27 d/d
Magnesite, Raw ... £10 - £11 d/d
Molybdenite (8% basis) ... 104s. 9d. per unit c.i.f.
Wolfram (65%) U.K. ... 425s. nom. c.i.f.
Tungsten Metal Powder ... 32s. 9d. nom. per lb. (home for steel manufacture)
Ferro-tungsten ... 29s. 9d. nom. per lb. (home)
Carbide, 4-cwt. lots ... £30 3s. 9d. nom. per ton
Ferro-manganese, home ... £43 15s. 2d. per ton
Manganese Ore U.K. (48%-50%) ... 72d. per unit
Brass Wire ... 2s. 9½d. per lb. basis.
Brass Tubes, solid drawn ... 2s. 3½d. per lb. basis.

THE MINING MARKETS

(By Our Stock Exchange Correspondent)

Markets were again quiet and holiday influences are clearly still being felt. The gilt-edged, however, were firm and prices improved all round. Sentiment was helped by the success of the Nyasaland and Johannesburg issues even though the latter opened at a discount. On Wednesday, there was a further sharp jump following the improved export and import figures.

The Rand prices show how idle trading conditions were Dominion Reefs gave statutory notice on their intention to cease mining operations in three months, but stated that the cessation of operations is not thereby obligatory. The financial position has been seriously aggravated by the company's liability under the South African Silicosis Act. Later, buyers came in for the shares at the lower levels and they rallied to 9d. Earlier in the week interest was shown in Randfontein in the hope that some announcement might be made about the starting of uranium production in the near future. Later, the shares turned easier.

The O.F.S. section attracted more attention. Free State Geduld were quoted ex-rights and improved on the success of the issue. The new shares changed hands up to a premium of 22s. 9d. Buying of Western Holdings developed in Johannesburg and the shares improved but the best levels were not held. Ofsits were also outstanding.

West African gold shares, while quiet, showed a distinctly better tendency. Improved results from Amalgamated Bank showed that the re-organization of the company is at last beginning to take effect. This coupled with the record Ariston revenue return, caused the improvement. The latter company achieved a figure of £126,924 for July against £116,649 in June; costs fell by as much as 1s. 9d. per ton. Bremang recorded an operating profit for July of £14,494 against £26,523 for June. The acreage worked by No. 2 dredge was much reduced, this will shortly be closed down and transferred to the Offin River. On these figures it seems that the company will continue to make a profit, albeit reduced, provided

the three remaining dredges can maintain the present rate of production.

Australian gold issues languished in gloom. The Sons of Gwalia mine returned no profit and no dividend for 1951 due to a broken crankshaft on the main winch which stopped operations for 17 days and the continued drift away of underground labour. The latter difficulty is, of course, endemic throughout the field.

Coppers were patchy but improved on interest from Paris. Rio Tintos, although not holding last week's high level, closed above the worst and most other issues finished firmer in a narrow market.

Tin shares were one of the main points of interest. Almost without exception they were down following the heavy fall in the metal price, but mostly closed a few points above the bottom on the steadier tendency towards the end of the period. The issue of new shares by Malayan Tin Dredging was successful and over-subscribed. Gevor improved following further hopes that the company would receive special tax consideration. Beraltis also rose on optimism over the coming report. The chairman of Sungei Kinta stated that it was not the intention of the board to make any capital distribution from accumulated reserves and that he did not agree that the life of the property was only six years. Recently, a total of 66 acres of fresh ground were acquired. The immediate future of tin shares is obscure, but it seems likely that companies can continue to make reasonable profits provided the prices do not fall much below the present level. It is also relevant to remember that few fresh tin producing areas have been discovered in recent years and that world consumption continues at a high level.

Asbestos shares were in good demand as also were leading manganese issues. International Nickel recovered on the encouraging quarterly report, but it is interesting to see that the company are preparing a complex marketing system against the time when sales conditions again become highly competitive.

FINANCE			Price			Price			Price			Price			Price			Price		
			Aug. 13			Aug. 13			Aug. 13			Aug. 13			Aug. 13			Aug. 13		
			+ or -			+ or -			+ or -			+ or -			+ or -			+ or -		
			on week			on week			on week			on week			on week			on week		
AFRICAN & EUROPEAN			2 1/2	-	0.5	6 1/2	-	0.5	24 3/4	-	3d	48 1/2	-	1 1/2	12 1/2	-	6d	48 1/2	-	1 1/2
Anglo American Corp.			6 1/2	+	0.5	6 1/2	+	0.5	36 1/2	-	2 1/2	27 1/2	-	1 1/2	17 1/2	-	6d	27 1/2	-	6d
Anglo-French			20 1/2	-	0.5	6 1/2	-	1 1/2	4 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d
Anglo Transvaal Consol.			25 1/2	-	0.5	6 1/2	-	1 1/2	28 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d
Central Mining (1 shrs.)			37 1/2	-	6d	16 1/2	-	3d	66 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d
Consolidated Goldfields			45 1/2	-	0.5	18 1/2	-	4d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d
Consol. Mines Selection			25 1/2	-	0.5	10 1/2	-	1 1/2	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d
East Rand Consol.			2 1/2	-	0.5	4 1/2	-	1 1/2	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d
General Mining			4 1/2	-	0.5	15 1/2	-	1 1/2	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d
H.E. Prop.			32 1/2	-	0.5	15 1/2	-	1 1/2	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d
Henderson's Transvaal			9 1/2	-	0.5	19 1/2	-	1 1/2	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d
Johnnies			24 1/2	-	0.5	17 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d
Rand Mines			4 1/2	-	0.5	16 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d
Rand Selection			41 1/2	-	0.5	16 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d
Strathmore Consol.			28 1/2	-	0.5	11 1/2	-	1 1/2	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d
Union Corp. (2 1/2 units)			35 1/2	-	0.5	24 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d
Vereniging Estates			35 1/2	-	0.5	3 1/2	-	0.5	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d
Wits			35 1/2	-	0.5	14 1/2	-	1 1/2	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d
West Wits			44 1/2	-	1 1/2	14 1/2	-	1 1/2	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d
RAND GOLD																				
Blyvoor			44 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d
Brakpan			18 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d
City Deep			34 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d
Consol. Main Reef			33 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d
Crown			45 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d
Daggas			5 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d
Dorfontein			27 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d
Durban Deep			5 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d
E. Daggas			19 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d
E. Geduld			47 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d
E. Rand Props.			6 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d
Geduld			12 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d
Govt. Areas			12 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d
Grootvlei			31 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d
Libanon			13 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d
Lilpards Vlei			21 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d
Marivale			21 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d
Modderfontein East			23 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d
New Kleinfontein			28 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d
New Pioneer			24 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d
Randfontein			22 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d
Robinson Deep			12 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d
Rose Deep			26 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d
Simmer & Jack			6 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d
S.A. Lands			39 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d
Springs			7 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d
Stuiffontein			26 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d
Sub Nigel			2 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d
Van Dyk			13 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d
Venterspost			19 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d
Vlakfontein			17 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d
Voegstreek Estates			28 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d
West Driefontein			6 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d
W. Rand Consolidated			52 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d
Western Reefs			43 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d
WEST AFRICAN GOLD																				
Amalgamated Bank			1 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d	14 1/2	-	3d

Company News and Views

Kaduna Prospectors to Make Capital Repayment

Sir Godfrey Fell, chairman of Kaduna Prospectors, in his statement accompanying the report and accounts for the calendar year 1950, prepared shareholders for a decline in the 1951 production figure when he said that the reduction in output at the end of five months, which totalled 23 tons against 33½ tons in the comparable period of 1950, was due in part to a unusual shortage of water and in part to the company's policy of taking advantage of the high tin price to work lower grade ground than it would be profitable to mine at lower prices.

Year to Dec. 31	Output (Tons)	Tax	Net Profit	To Reserves	Dividend	Carry Forward
		£	£	£	%	£
1951	69	10,776	5,481	Nil	33½	3,540
1950	84	11,956	8,090	3,033	33½	3,125

The preliminary statement now published covering the financial results for 1951 showed that shareholders have not been adversely affected by the company following this prudent policy. But the decline in the net profit was such that the company, in order to maintain its distribution, was not able to strengthen its reserves—although the carry forward came out slightly stronger than the preceding year. From the monthly output returns for the first six months of the current year, which shows that output totalled 41½ tons against 28 tons in the corresponding period of the year under review, it would appear that the company has reverted to working higher grade ground.

Shareholders will, no doubt, be looking forward to hearing what Sir Godfrey has to say at the Annual General Meeting, to be held on September 10, about the work now being done in that part of the Niger Valley in which the company has been carrying out prospecting. The Annual Meeting will be followed by an Extraordinary Meeting at which special resolutions will be submitted for shareholders' approval authorizing application to the Court for permission to make a capital repayment of 1s. per 3s. share. The question of making a capital repayment had been under consideration for some time and shareholders, in a circular dated May 29 last, were informed that the company would take a decision on this once the company's position *vis-a-vis* E.P.L. had been clarified.

Kaduna Syndicate Maintains Distribution

An unusual shortage of water, together with a policy of working lower grade ground while prices for tin remained high, were also the reasons advanced by Sir Godfrey Fell, chairman, at Kaduna Prospectors Annual Meeting last year to explain the reduction in output during the first five months of the current year to 106 tons compared with 136 tons in the comparable period of 1950. Thus, shareholders will not be surprised to find that the total output for the year 1951 of 258 tons reflects a decline of 59 tons compared with the preceding year.

The preliminary statement now published covering the financial results for 1951 shows that, as in the case of Kaduna Prospectors, shareholders were unaffected by the lower profit figure. The tax man took less, reserves received nil, and the carry forward improved slightly.

Year to Dec. 31	Output (Tons)	Tax	Net Profit	To Reserves	Dividend	Carry Forward
		£	£	£	%	£
1951	258	49,000	24,782	Nil	50	11,302
1950	317	52,866	33,757	10,542	50	11,134

Comments concerning prospecting in the Niger Valley and the capital repayment scheme stated in the note on Kaduna Prospectors are also applicable to Kaduna Syndicate.

Naraguta Karama and Naraguta Extended Reduced Profits

The preliminary statements of Naraguta Karama Areas and Naraguta Extended Areas for the year ended December 31, 1951, show that in the case of both companies profits declined sharply as did their respective allocations to reserves. But the Exchequer was the big loser. Shareholders suffered little, in fact not at all in the case of Naraguta Karama.

While it will be necessary to await publication of the full reports and accounts for an explanation of these disappointing results, there are good grounds for believing that the profit reductions can be attributed to a sharp rise in working costs and to the adverse

effects of the first full year's operations of the new scale of royalty payments to the Nigerian Government. These factors would appear to be even more applicable to Naraguta Karama, as output showed an increase of 14 tons, than to Naraguta Extended whose production contracted by 37 tons.

Year	Output (Tons)	Working Profit	Tax	Net Profit	Dividend	To Reserves
		£	£	£	%	£
Naraguta Karama						
1951	168½	25,240	15,800	9,440	9	3,500
1950	154½	41,801	23,350	18,451	9	11,500
Naraguta Extended						
1951	99	13,699	9,100	4,599	9	—
1950	136	40,316	23,350	16,966	9½	9,530

Indeed, with a higher output and a higher average price obtaining for tin in 1951 than in 1950, Naraguta Karama's financial results might have been expected to show some improvement. However, with the royalty percentage rates increased by 1 per cent for every rise of £100 per ton over the previous maximum of 10 per cent, with metallic tin at £300 per ton or over, to 17 per cent with tin at £1,000 per ton or over, it would appear that what benefits might have accrued from a higher production figure has been siphoned off to meet the royalty payments.

South Bukuru Earns Less But Pays Same

The preliminary announcement of South Bukuru Areas for the year ended December 31, 1951, shows that while the production of tin ore was slightly down, output of columbite showed a slight improvement. The better columbite figure may prove to be of importance for it may indicate that the output of this strategic metal may continue to increase during the current year and with the new M.S.A. order now in force, giving producers a price per unit of about double the current market price, it could come to be a most useful source of additional revenue to the company.

Year	Output Tin (Tons)	Working Profit	Tax	Net Profit	Dividend	To Reserves
		£	£	£	%	£
1951	57½	4	8,663	5,600	3,063	12½
1950	62½	3½	14,750	8,400	6,350	12½

As in the case of Naraguta Karama and Naraguta Extended, discussed above, the decline in the net profit comes as a surprise. But here again it may well be that the increased royalty payments to the Nigerian Government and the rise in labour costs are directly responsible for this reduction.

Once again, the tax man suffered more than the shareholders and by not making any allocation to reserves in the current year, the company was able to show a carry forward of £4,049 against £2,808.

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The following is the report on the work done during the quarter ended June 30, 1952:—

Tons Crushed	22,627
Estimated Profit from Antimony and Gold	£87,066
Estimated Taxation	£16,000

In addition, revenue of £830 was received during the quarter in respect of increased revenue from the sales of gold at higher than standard prices, and from variations in official gold prices during the six months ended June 30, 1952.

The capital expenditure during the period amounted to £36,281.

During the quarter the Development footage accomplished amounted to 4,574 ft., of which 1,183 ft. were in the ore body. The sampling of 1,170 ft. in the ore body gave the following results:—

Payable on account of the combined gold and antimony content, 583 ft.; Unpayable, 587 ft.

In determining the payable footage the prices of Gold and Antimony as at June 30, 1952, have been used.

The development figures mentioned above are the actual result of the sampling of development work in the ore body; no allowance has been made for modifications which may be necessary when computing the ore reserves.

By Order of the Board,
ANGLO-TRANSVAAL TRUSTEES LIMITED,
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BREMANG GOLD DREDGING

The Fifteenth Annual General Meeting of Bremang Gold Dredging Co. Ltd., was held on August 8 in London.

Major-General W. W. Richards, C.B., C.B.E., M.C., chairman of the company, presided.

The following is an extract from the statement of the Chairman which was circulated with the report and accounts for the year ended December 31, 1951:—

Bullion revenue at £510,739 after realization charges shows an increase of £41,270 over last year's figure. This is accounted for by the increase in the oz. of gold recovered, 40,861, against 37,916, and to the fact that 4,390 oz. were sold on the free market at premium prices yielding an additional £6,200.

The aggregate operating costs were up by £8,000 at £300,801. The gold duty paid to the Gold Coast Government was £24,005—equal to 11s. 9d. per oz.; the comparable rate in the previous year was 15s. per oz.

Increased profits, together with higher rate of profits tax, account for the increased appropriation for taxation—£88,238, against £63,725. The profit for the year is £58,654, out of which the directors recommend the distribution of a dividend of 7½ per cent, less income tax, requiring £41,509. The credit balance carried forward on profit and loss account is increased to £41,964.

The aggregate of the fixed assets in the balance sheet before writing off depreciation shows an increase during the year of £137,870. Net cash disbursements in this respect were £46,220 and the balance of £91,650 represents the par value of the shares issued to the Gold Coast Selection Trust as part consideration for the Offin/Jimi Rivers Areas.

During the financial year to December 31, 1951, the total bullion recovered was 44,642 oz. from 8,183,800 cu. yd. These figures compare with 41,510 oz. of gold from 8,707,130 cu. yd. during the previous year.

Ore reserves as at December 31, 1951 totalled 213,953,700 cu. yd. at 2.66 grains per cu. yd. The previous grand total was 212,963,700 cu. yd. at 2.73 grains per cu. yd.

In conclusion, I would mention that the returns so far available for the current year (January-May inclusive) show that 2,953,700 cu. yd. have been dredged, yielding 15,051 oz. of gold and an estimated operating profit of £68,900. These figures compare with 3,699,000 cu. yd., 16,775 oz. and £90,564 profit for the corresponding period of last year.

The report and accounts were adopted.

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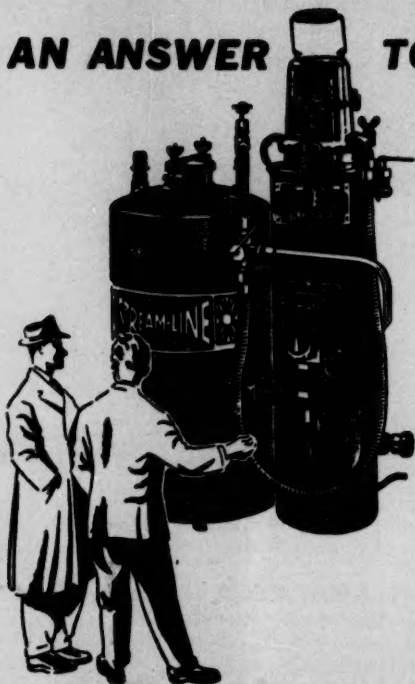
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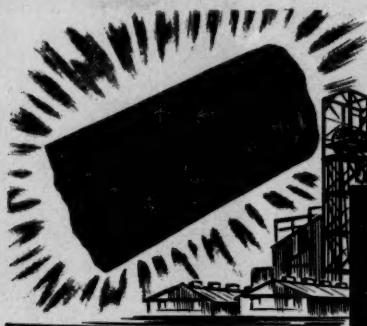
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